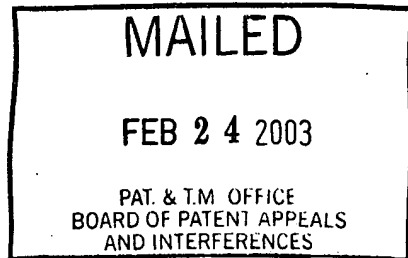


The opinion in support of the decision being entered today was not written
for publication and is not binding precedent of the Board.

Paper No. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**



Ex parte JOSEPH B. KEJHA

Appeal No. 2002-1780
Application No. 08/950,445

HEARD: February 4, 2003

Before ABRAMS, FRANKFORT, and NASE, Administrative Patent Judges.
NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 10 to 12. Claims 1 to 9 and 13 to 33, which are all of the other claims pending in this application, have been withdrawn from consideration.

We AFFIRM.

BACKGROUND

The appellant's invention relates to an electric vehicle. A copy of the claims under appeal is set forth in the opinion section below.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

West	3,517,766	June 30, 1970
Munday	5,143,025	Sept. 1, 1992
Minami et al. (Minami)	5,462,021	Oct. 31, 1995

Claim 10 stands rejected under 35 U.S.C. § 103 as being unpatentable over West in view of Minami.

Claims 10 to 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over West in view of Munday.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejections, we make reference to the answer (Paper No. 25, mailed February 21, 2002) for the examiner's complete reasoning in support of the rejections, and to the brief (Paper No. 24, filed December 10, 2001) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations which follow.

The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. See In re Young, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991) and In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Moreover, in evaluating such references it is proper to take into account not only the specific teachings of the references but also the inferences which one skilled in the art would reasonably be expected to draw therefrom. In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

When it is necessary to select elements of various teachings in order to form the claimed invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by the appellant. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. The extent to which such suggestion must be explicit in, or may be fairly inferred from,

the references, is decided on the facts of each case, in light of the prior art and its relationship to the appellants' invention. As in all determinations under 35 U.S.C. § 103, the decision maker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the appellant's structure as a template and selecting elements from references to fill the gaps. The references themselves must provide some teaching whereby the appellant's combination would have been obvious. In re Gorman, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (citations omitted). That is, something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. See In re Beattie, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992); Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984).

The claimed subject matter under appeal

Claims 10 to 12 read as follows:

10. Electric vehicle construction which includes a body for carrying at least one passenger and an electric propulsion system with at least one electric motor, at least one battery, at least one electric current generator for charging said battery and which is driven by an internal combustion engine, and a hydrogen storage system having hydrogen therein attached to said body, and which body rides on two wheels with a steering, system attached to said body, the improvement wherein
said engine is an open to air combustion engine and is fueled only by said hydrogen.

11. Electric vehicle construction which includes a body for carrying at least one passenger and an electric propulsion system with at least one motor, at least one battery, at least one electric current generator for charging said battery and which is driven by an u eternal combustion engine, and a hydrogen generating cell attached to said body, and which body rides on two wheels with a steering system attached to said body, the improvement wherein

said engine is open to air combustion engine and is fueled only by hydrogen which is produced by electrolysis of water in said hydrogen generating cell, said cell is electrically connected to said generator and also to said battery, the hydrogen is not stored under pressure and is immediately consumed by said engine.

12. Electric vehicle construction which includes a body for carrying at least one passenger and electric propulsion system with at least one electric motor, at least one battery, at least one electric current generator for charging said battery and which is driven by an internal combustion engine, a hydrogen storage system having hydrogen therein and a hydrogen generating cell which generates hydrogen by electrolysis of water, the improvement wherein

said engine is open to air combustion engine and is fueled only by hydrogen, the hydrogen being supplied from said storage system and from said hydrogen generating cell, said cell is electrically connected to said generator, and said cell is also electrically connected to said battery.

The teachings of the applied prior art

West

West's invention relates to improvements in battery-operated vehicles and, more particularly, to an electric power supply system for a battery-operated vehicle, the electric battery of which is able to be continuously charged through a generator driven by a small internal combustion engine. One object of West's invention was to provide a vehicle for transportation on streets, roads, parkways, super-highways and the like, particularly in towns or congested areas where air pollution is a troublesome problem.

Figure 1 of West shows a vehicle with a light body 1 carried by front and rear wheels 2f and 2r of a wheeled chassis. Road wheels 2f are connected through a differential gear 3 and are driven by an electric traction motor 4 through a gear box 5. The front wheels 2f are connected to a steering column 6 through a suitable mechanical joint 7 as those skilled in the art will readily understand. A single pedal control 8 is shown mechanically connected to a potentiometer 9. A battery 10 is connected to the potentiometer 9 through conduits 11 and 12 and the electric traction motor 4 is connected through conduit 13. At the rear of the vehicle is an internal combustion engine 14 connected mechanically through a gear box 15 to drive twin generators 16 and 17. Conduits 18 and 19 from the twin generators 16 and 17 connect the generators to the battery 10 and also to the electric circuit of the traction motor 4 and the potentiometer 9. West refers to the internal combustion engine 14 as a petrol (i.e., gasoline) engine at various places in the specification (e.g., column 5, line 20; column 8, line 15; column 9, line 13).

Minami

Minami's invention relates to a hydrogen gas supply system for a hydrogen engine¹ which is a clean engine which emits only water. The hydrogen gas supply system of Minami's invention can be mounted on a vehicle in the following manner. For example, as shown in Figures 15 and 16, in the case of a cab-over type vehicle in which a cabin 102 is positioned above a hydrogen engine 101, a connection unit 107 is provided between a pair of side frames 104 and 105 near the rear end of a vehicle body 103 and another connection unit 108 is provided on the outer side of the side frame 104 with connection units being exposed downward. Reference numeral 106 denotes hydrogen fuel cartridges. The connection unit 108 is mounted to be swung outward as shown by the chained line in Figure 16 and the fuel cartridges 106 are changed with the connection unit 108 in the swung position. In the case of a sedan type vehicle 109, a connection unit 113 is provided between side frames 111 and 112 below a trunk 110 on the rear of the vehicle to extend in the transverse direction of the vehicle body as shown in Figures 17 and 18.

¹ The examiner has characterized the hydrogen engine of Minami as an internal combustion engine (answer, p. 4). However, Minami does not describe his hydrogen engine as an internal combustion engine and we fail to find any evidence that Minami's hydrogen engine is an internal combustion engine which is an open to air combustion engine as recited in each of the claims under appeal.

Munday

Munday's invention relates generally to a fuel system of internal combustion engines, and more particularly to a hydrogen and oxygen producing system to provide fuel to an internal combustion engine.

Munday teaches in the background of the invention section (column 1, lines 10-39) that

[p]etroleum fuels have been used to operate internal combustion engines ever since the invention of the internal combustion engine. In fact, petroleum fuels have been used so much over the past one hundred years they are becoming short in supply. Shortage of gasoline has at times created gasoline lines at filling stations. Because of pending greater shortages, there are several research projects focused on new sources of fuels. Petroleum shale has been researched as a potential new source of fuels, however, research has been expensive and slow. Another source of fuel is natural gas.

A greater problem with the use of petroleum fuels is the pollution created by burning them. Petroleum products contain several pollutants such as sulfur compounds, carbon monoxide, and trace metals that are released into the atmosphere when burned. The obvious concerns with petroleum pollutants are the effects on the environment and humans. Wildlife and plant life are being destroyed by the effects of pollution. Humans are developing respiratory problems and other pollution related problems.

There have been attempts to provide an internal combustion engine that would use fuels other than petroleum fuels. One of the better known fuels is alcohol, which was used during the Second World War in European countries. Another is hydrogen gas which has a low flash point and very dangerous to carry in a vehicle. Finally, mixtures of hydrogen and oxygen gases have been used as fuel for internal combustion engines.

The primary object of Munday's invention was to provide a hydrogen and oxygen gases production system by electrolysis of water for direct use in an internal combustion engine. Another object of the invention was to provide a hydrogen and oxygen gases production system adaptable to existing internal combustion engines.

Figure 1 shows an internal combustion engine 10 connected by an intake manifold 12 and an exhaust manifold 14 to a fuel tank 16. An oxygen gas inlet manifold 18 carries oxygen gas to the inlet manifold 12. Hydrogen gas inlet manifold 20 also carries gas to the inlet manifold 12. The two gases, hydrogen and oxygen, are mixed together just before entering the inlet manifold to prevent any flash back. Exhaust gases are moved from the engine 10 through manifold 14 and exhaust tube 22 which empties into the fuel tank 16.

As better shown in Figure 2, oxygen is removed from the fuel tank 16 and carried to a vertical mixing or combining manifold 24. Hydrogen is similarly removed from the fuel tank 16 and carried to the mixing manifold 24 which has an opening 25 to the intake manifold 12 and separate inlet pipes 18 and 20 where the two gases are combined before entering the manifold 12. A single cylinder 26 and a reciprocating piston 28 represent the internal combustion engine. The fuel gases are forced into the cylinder 26 and pass an intake valve 30 which opens and closes to only emit gases. An

valve 32 opens to allow egress of used gases and water vapor. The fuel gases are ignited by a spark from spark plug or glow plug 34.

The fuel production tank 16 (see Figures 2 and 5-7) is divided into three compartments 36, 38 and 40 by dividers 42 and 44. There is communication between the compartments along the bottom of the tank 16. Water is allowed to flow between the compartments along the bottom of the tank. On the other hand, the dividers 42 and 44 have inclined top walls 46 and 48, respectively, which isolates the hydrogen gases in compartment 36 from the oxygen gases in compartment 40. Each compartment 36 and 40 has an outlet 50 and 52, respectively, for removing the electrolytically produced hydrogen and oxygen. Center compartment 38 is for receiving additional water for the tank and for the exhausted gases and water vapor from exhaust pipe 22. Center compartment 38 has an inlet 54 for admitting exhaust gases and water vapor.

A plurality of cathodes 56 are mounted in compartment 36 with the electrode positioned above the bottom edge of partition 42 to prevent hydrogen formed by the cathodes 56 from escaping. Each cathode 56 has an electrical lead 58 which connects to a source of electricity. A glass or some type of insulating tube 60 surrounded the cathodes 56 to keep the hydrogen gases away from the cathodes, making them more

efficient. A similar number of anodes 62 are mounted in compartment 40, again with the electrodes positioned above the bottom edge of partition 44 to prevent oxygen formed by the anodes 62 from escaping. Each anode 62 has an electrical lead 64 which connects to a source of electricity. Glass or some type of insulating tube 60 surrounds the anodes 62 to keep the oxygen gases away from the anodes.

Figure 3 is a schematic of the internal combustion engine 10 and the fuel production tank 16. The production tank 16 is divided into hydrogen and oxygen production compartments 36 and 40, respectively. There is a divider 57 separating the compartments 36 and 40. In this figure there is no center compartment 38 as in Figure. 2, instead exhaust gases are pumped into compartment 36. Fresh water is added via fill pipe 66 into compartment 40. There are cathodes 56 in compartment 36, and anodes 62 in compartment 40.

The rejection of claim 10 over West in view of Minami

We will not sustain the rejection of claim 10 under 35 U.S.C. § 103 as being unpatentable over West in view of Minami.

In our view, the subject matter of claim 10 is not suggested by the combined teachings of West and Minami. While the combined teachings of West and Minami may

have suggested modifying West's electric vehicle by replacing West's internal combustion engine 14 with a hydrogen engine supplied with fuel from a hydrogen gas supply system as taught by Minami, we have not found any evidence that Minami's hydrogen engine is an internal combustion engine which is an open to air combustion engine as recited in claim 10. Since the applied prior art does not establish that Minami's hydrogen engine is an internal combustion engine which is an open to air combustion engine, we conclude that the applied prior art fails to establish that it would have been obvious at the time the invention was made to a person of ordinary skill in the art to have modified West's electric vehicle to arrive at the subject matter of claim 10.

For the reasons set forth above, the decision of the examiner to reject claim 10 under 35 U.S.C. § 103 as being unpatentable over West in view of Minami is reversed

The rejection of claims 10 to 12 over West in view of Munday

We sustain the rejection of claims 10 to 12 under 35 U.S.C. § 103 as being unpatentable over West in view of Munday.

In our view, the subject matter of claims 10 to 12 is suggested by the combined teachings of West and Munday. In applying the above-noted test for obviousness, we reach the conclusion that it would have been obvious at the time the invention was

made to a person of ordinary skill in the art to have modified West's electric vehicle by modifying West's internal combustion engine 14 to be fueled by hydrogen as suggested and taught by Munday to reduce pollution as taught by Munday.

The arguments advanced by the appellant (brief, pp. 23-27) do not convince us that the currently claimed subject matter is patentable under 35 U.S.C. § 103 over the combined teachings of West and Munday. As should be apparent from the preceding paragraph we disagree with the appellant that the claimed subject matter is not suggested by the applied prior art. While the appellant is correct that both West and Munday lack certain features of the claimed invention, it is well-established that nonobviousness cannot be established by attacking the references individually when the rejection is predicated upon a combination of prior art disclosures. See In re Merck & Co. Inc., 800 F.2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986). In addition, the appellant points out numerous features of the disclosed invention (e.g., range of travel), however, features not claimed cannot be relied on to establish patentability. See In re Self, 671 F.2d 1344, 1348, 213 USPQ 1, 7 (CCPA 1982). Lastly, with regard to claim 12, we agree with and incorporate the examiner's rationale set forth in the answer (p. 8) that the claimed hydrogen storage system and hydrogen generating cell are met by Munday's system. In that regard, we note that the claim 12 does not recite both a valved hydrogen tank and a hydrogen generating cell supplying hydrogen to an internal

combustion engine which is an open to air combustion engine and is fueled only by hydrogen.

For the reasons set forth above, the decision of the examiner to reject claims 10 to 12 under 35 U.S.C. § 103 as being unpatentable over West in view of Munday is affirmed.

CONCLUSION

To summarize, the decision of the examiner to reject claim 10 under 35 U.S.C. § 103 as being unpatentable over West in view of Minami is reversed and the decision of the examiner to reject claims 10 to 12 under 35 U.S.C. § 103 as being unpatentable over West in view of Munday is affirmed.

Since at least one rejection of each of the appealed claims has been affirmed, the decision of the examiner is affirmed.

AFFIRMED

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